



COURSE GUIDE



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GREENHECK EDUCATIONAL OPPORTUNITIES

March 2025

Course Description

Professional Development Hours

CAP-001 Increasing Design Efficiency Using Software

1

This course discusses how computer-aided product selection program allows one to improve and increase design throughput and productivity. Included is a demonstration on how to size, select, apply, specify, schedule and generate AutoCAD® or Revit® drawings for fans, dampers, make-up air, energy recovery, kitchen hood systems, and louvers for projects as well as other time-saving program features.

COR-001a Applying State-of-Art Engineering Technology in Manufacturing Part A Innovation

.75

This course will introduce you to state-of-the-art engineering technology for designing and manufacturing world class HVAC equipment. You will observe and tour an AMCA Air chamber and rapid prototyping.

COR-001b Applying State-of-Art Engineering Technology in Manufacturing Part B Commercial

1

This course will introduce you to state-of-the-art engineering technology for designing and manufacturing world class HVAC equipment. You will observe and tour an AMCA Air chamber and rapid prototyping.

DPR-001 Life Safety Dampers

.75/1

Developed to provide basic information on life safety dampers, this course discusses fire, fire smoke, smoke and ceiling radiation dampers and their UL testing requirements, application, and installation. Ease-of-use methods for installation as well as control options that can be supplied for life safety dampers will be presented.

DPR-002 Backdraft Dampers

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This course discusses the basics of backdraft and pressure relief dampers commonly used in the industry. Velocity and static pressure limitations as well as proper application of a backdraft damper will be discussed, along with how to properly specify to meet project requirements. Applicable codes and standards will be reviewed.

DPR-004 Selecting and Specifying Control Dampers for Energy Efficiency

.75

This course discusses how to improve your specifications and schedules to minimize energy and sound in duct-mounted damper systems. This course will assist you in the selection and application of dampers for flow control resulting in lower system energy and sound.

DPR-006 Proper Application and Specification of Ceiling Radiation Dampers and Ceiling Radiation Damper-Ceiling Exhaust Fan Combinations

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An overview of the purpose of ceiling radiation dampers commonly utilized in commercial construction. This course discusses relevant test standards and 3rd party certification, including applications and design assemblies for ceiling radiation dampers. The application and proper specification of ceiling radiation dampers in conjunction with bathroom exhaust and ceiling exhaust fans is also explored.

FAN-002 Beyond Compliance - Applying FEI to Optimize Fan Systems

1

This course will introduce the current fan efficiency metric and how it is applied. Criteria and method for optimizing fan selection to minimize energy consumption will be presented. Revisions to ASHRAE standards and IgCC will be discussed. The 60 minute course will review the future ASHRAE and Department of Energy concerns regarding fan efficiency.

FAN-004 Specifying Proper Bearings for Fan Systems

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Proper bearing design and specification ensures long, trouble-free fan operation. This course reviews bearing nomenclature, proper bearing selection and specification for the application, bearing lubrication, and minimizing bearing failure on motors used with variable frequency drives.

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FAN-005 Understanding Sound: Specifying Fans to Meet Acoustic Requirements

1

Understanding and meeting acoustic criteria for HVAC applications is an ever-increasing project requirement. This course will review the various sound definitions, nomenclature, and measurement, as well as discuss fan and air handler acoustics. It will include a tour of an AMCA accredited reverberant test chamber.

FAN-006 Understanding Vibration; Properly Specifying Fans to Meet Vibration Requirements

1

Many HVAC applications require minimizing structural vibration. This course reviews the definitions and source of mechanical vibration and solutions to minimize it, along with proper vibration specification. A review of AMCA / ANSI 204 and observation of an actual fan vibration test is included.

FAN-007 Selecting and Specifying Equipment for Seismic Applications

1

Many geographic areas require mechanical HVAC equipment to withstand seismic events of various magnitudes. This course will discuss the requirements for applying equipment in a seismic zone, codes and standards and how to specify equipment to meet a project's seismic requirements, seismic testing, certification, and the California Office of Statewide Health Planning and Development (OSHPD) criteria.

FAN-008 Electronically Commutated (EC) Motors and Controls

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This course includes a comparison presentation of an electronically commutated (EC) motor driven fan to a traditional belt drive and a direct drive fan using permanently split capacitor (PSC) motors. This interactive demonstration illustrates the controllability, energy efficiency, reliability and payback of using EC motors in HVAC applications. The demonstration will also introduce you to additional systems and applications for variable fan flow based upon pressure, temperature, humidity, volatile organic compounds (VOC), and CO2 space control.

FAN-009 System Effect Demonstration

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This course demonstration will identify the common causes that result in deficient fan performance. You will observe how "system effect" is caused by poor duct configurations on the fan inlet or outlet which affects catalogued performance. The four AMCA test methods to understand correct installation related to fan installation will also be discussed.

FAN-010 Cost Effective Ways to Protect Fan Motors

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This course presents how to reduce project costs and ensure that fan motor starters are properly sized and supplied, simply by changing your project specifications. This session will review motor starter technology along with the benefit to the customers and engineers by having the motor starter supplied with the fan. Included are detailed sample specifications.

FAN-011 Laboratory Fume Exhaust

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This course is aimed at familiarizing participants with the basics of laboratory ventilation and emphasizing the importance of codes and standards for laboratory design. AMCA's Induced Flow Ratings Seal will be explained along with a discussion on airflow measurement and controls. The differences between constant and variable volume systems will be discussed, energy recovery considerations for laboratories, and reducing fan energy in demand-based laboratory exhaust systems.

FAN-012 Motor Technology in the HVAC Industry/EC Motor Demonstration

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This course examines new and existing motor technology in the HVAC industry. A comparison of traditional AC induction motors, permanent magnet (PM) and electronically commutated (EC) motor technology is presented. The interactive demonstration illustrates the controllability, energy efficiency, reliability and payback of using EC motors in single phase applications. The demonstration will also introduce you to additional systems and applications for variable fan flow based upon pressure, temperature, humidity, volatile organic compounds (VOC), and carbon dioxide space control.

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FAN-013 Understanding Air and Sound; Properly Specifying Fans to Meet Performance Requirements 1

Understanding and meeting air performance and acoustical criteria for HVAC applications are critical project requirements. This course reviews the fundamentals of air performance including nomenclature, reading fan curves and proper fan selections. Information regarding acoustical terminology will be presented along with the differences between sound power and sound pressure and how manufacturers acoustically test equipment.

FAN-014 HVLS Fan Design, Application, and Specification .75

This course covers the proper selection and specification of high volume, low speed (HVLS) fans for different applications. An overview of HVLS performance testing, performance data, safety and industry standards is included.

FAN-015 Ventilation Strategies Utilizing Ceiling Exhaust and Bathroom Exhaust Fans to Meet Indoor Air Quality Requirements 1

This course discusses the critical nature of indoor air quality (IAQ) including compliance with codes and standards, ventilation strategies, and fan sizing utilizing ceiling exhaust and bathroom exhaust fans. Now, more than ever, people are spending an increased amount of time in their residences. Effective IAQ contributes to the health and comfort of occupants while ensuring proper ventilation and moisture management.

FAN-016 COVID Mitigation Strategies Utilizing HVAC Systems 1

This course examines the role of HVAC equipment and systems in mitigating the risk of air borne viruses such as COVID-19. Fundamental technology such as outdoor air, ventilation, humidification, and filtration are reviews along with additive technologies such as electronic air cleaning devices. A case study of the re-opening of a commercial building with a focus on HVAC systems is presented.

FAN-017 Warehouse Ventilation Strategies and Design Considerations 1

This course is intended at familiarizing participants with typical heating and ventilation systems in warehouse applications. Topics include summer ventilation strategies, space heating systems, benefits of high volume, low speed (HVLS) fans for air circulation and life safety design considerations.

FAN-018 Lab Exhaust Systems- Redundancy and Sequence of Operation 1

This course reviews alternative sequences of operation for variable volume lab exhaust systems. We will review N+1 and N-1 exhaust system redundancy options and multiple solutions to control duct static pressure. The presentation concludes with advanced solutions including fan staging, chemical sensing and wind speed monitoring solutions which can be applied to safely reduce the cost of overall operation while ensuring an overall safe lab facility environment.

FAN-020 Lab Exhaust Systems- Best Practices 1

This course reviews design considerations to reduce sound, decrease vibration and prevent system effects for constant and variable air volume systems. This presentation concludes with review of technologies and maintenance considerations to ensure long term equipment life.

FAN-021 Lab Exhaust Systems- Decarbonization 1

This course reviews safe techniques to reduce the operational cost of a lab facility. We will review a variety of energy savings solutions including exhaust fan nozzle technology, variable volume controls solutions, energy recovery devices and chemical monitoring systems.

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KVS-001 Kitchen Ventilation Systems: Meeting Codes and Standards

1

Based on good kitchen design principles, this course focuses on products and concepts that promote energy efficient kitchen ventilation design. The value of demand ventilation (variable volume) systems and strategies regarding the application and selection of the right system configuration for various applications is discussed. Other topics include payback analysis, the integration with building management systems, and electronically commutated (EC) motors.

LVR-001 Specifying Equipment for Surviving Hurricane Wind Forces

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Equipment located in coastal applications are required to survive substantial wind loads, flying debris and/or wind-driven rain. This course will define equipment application criteria and review the current applicable standards and codes. Proper specification verbiage to meet Hurricane Prone Region applications will be presented, as well as a review of present and proposed future International Building Codes and the Florida Building Code.

LVR-002 Understanding AMCA 500-L Louver Weather Testing and FEMA 361 Tornado Shelters

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This course focuses on the different louver weather test procedures within AMCA 500-L while providing valuable louver application guidelines. FEMA 361 dictates stringent construction guidelines for FEMA funded Tornado Safe Rooms or Shelters. This course will provide you with an understanding of FEMA 361 along with an understanding of the type(s) of louver products required for compliance.

LVR-003 Understanding AMCA 500-L Louver Weather Testing and Louvers for Specific Market Segments

1

This course focuses on the different louver weather test procedures within AMCA 500-L while providing valuable louver application guidelines. Additionally, this course will provide you with an understanding of most commonly applied louver types for specific market segments such as data centers and warehouse/distribution center projects.

TAP-001 Air-to-Air Energy Recovery

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This course discusses the benefits of air-to-air energy recovery applied to ventilation systems and energy recovery technology (devices), pros and cons of available technology, psychrometrics, payback analysis, and the latest energy standards and code mandates. An overview of typical energy recovery applications and design considerations such as frost protection, bypass, and controls is included.

TAP-002 Make-Up Air Ventilation

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This course discusses make-up air systems used in commercial kitchens and industrial applications. Topics include heating and cooling technologies, energy reduction strategies, direct and indirect gas heating technology, controls, UL requirement for cooling in kitchens, demand-based ventilation for saving energy, processing make-up air, and building pressurization. Applications for 80/20 vs. 100% outdoor air, the benefits of direct-fired gas heat vs. other heating systems for warehouses, and codes and standards.

TAP-003 Conditioning High Percentages and 100% Quantities of Outdoor Air

1

This course discusses common HVAC systems found in commercial and institutional applications and the methods used to condition high percentages of outdoor air with an overview and comparison of Single Zone Variable Air Volume (VAV), Multi-Zone Variable Air Volume (VAV) and Dedicated Outdoor Air Systems (DOAS). Significant reduction of energy use can be achieved by applying different equipment schemes. The benefits of applying total heat energy recovery, decoupling latent and sensible loads, different compressor technologies, economizer options modulating head pressure control, and high turndown furnaces are reviewed in detail. New codes and efficiency standards are also reviewed that apply to dedicated outdoors air systems.